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NEW LIZARDS AND A NEW TOAD FROM THE DUTCH EAST INDIES, WITH NOTES ON OTHER SPECIES.

BY THOMAS BARBOUR.

The identification of the herpetological material which I collected in the East Indies during a part of 1906–7 has just been completed. I find some points of interest regarding geographic races in several of the species, and there are other specimens which can not be referred to any form described up to the present time. A complete list is now almost ready but it seems advisable to publish the following preliminary descriptions.

Leiolepisma pullum sp. nov.

Type.—No. 7486, Museum of Comparative Zoology, from Humbolt's Bay, Dutch New Guinea, collected by T. Barbour, January, 1907.

Closely related to *L. fuscum* (D. & B.) and *L. beccarii* (Ptrs. & Doria), but differing from both these species as the appended description shows: Habit lacertiform. Fingers four, toes five; distance between the end of the snout and the fore-limb contained once and one-fourth in the distance between axilla and groin; snout obtuse. Lower eyelid with an undivided transparent disc, smaller than the ear-opening. Nostril pierced in a single nasal; supranasal absent; frontonasal much broader than long, broadly in contact with the rostral, and very narrowly in contact with the frontal; latter shield a little shorter than frontoparietal, in contact with the first and second supraoculars; four supraoculars, seven superciliaries; frontoparietal single, followed by a small interparietal, parietals forming a median suture; a pair of nuchals, and a pair of temporals border the parietals; four labials anterior to the subocular. Ear-opening oval, larger than the transparent disc; auricular lobules present, and entering the anral aperture from all sides. 42 rows of scales round the body; dorsals and laterals all distinctly tricarinate; preanal scales very slightly enlarged. The hind limb reaches a little beyond the anterior side of the fore-limb. Subdigital lamellae under the fourth toe, 32. Tail almost exactly twice as long as head and body. Color dark mahogany brown above, uniform except for

two crossing, irregular, zig-zag lines of light spots, many of which have black centers. The crossing lines enclose areas which are roughly diamond shaped. The region where these lines occur is that between the fore and hind-limbs. On each side an irregular dark band, more or less broken up into squarish blotches by white vertical lines. This lateral band is not edged below with a lighter color, but fades away gradually into the yellow of the belly. There are two light longitudinal stripes on the sides of the tail, with brown above and yellow below.

Although the great majority of the wide-ranging skinks do not seem to show any definite variations connected with the locality from which they come, nevertheless two of these lizards do separate into distinct geographic races. The first which I shall discuss is

Dasia smaragdinum (Lesson).

Lesson, Voy. Coquile Zool. II, 1830, p. 43, pl. 3, fig. 1.
Boulenger, Cat. Liz. B. M., III, 1887, p. 250.

Type locality.—Oualan, Caroline Islands.

Lesson figured and named not only this species from Oualan, but also what he called *Scincus viridipunctus* (pl. 4, fig. 1). A comparison of these figures with large series from New Guinea, Waigiu, Jobi, and New Britain islands, from the Pelew, Marshal, and Caroline islands, and then from Ceram, Ternate, Obi, and Halmahera, shows that Lesson's figure of *smaragdinum* was undoubtedly drawn from a Papuan individual. The examples are all the same and unvarying in color for three races based upon definite and unchanging color-phases which do not seem to be correlated with modifications in the squamation. All of the Papuan specimens without exception—I have before me more than 50—are vivid green over the anterior part of the body; while the posterior may be either green or may fade to a reddish buff color. This type of coloration, so far as the material in hand shows, never occurs in the Marshal, Caroline, or Pelew islands, nor from the Moluccas; and this skink may be called *D. smaragdinum smaragdinum* (Lesson), based upon pl. 3, fig. 1, the characters being there excellently shown, though the locality of the specimen evidently is incorrect. It may be mentioned here that some of the other lizards recorded or described from the Carolines by Lesson need confirmation. All of the Polynesian specimens at hand,—ten from Ebon, Marshal Islands; two from Pelew, and two from Ruk in the Caroline Islands,—are all alike and unvarying in color. This is the form represented by Lesson in pl. 4, fig. 1. It may be known as: *D. smaragdinum viridipunctum* (Lesson). The specimens from the Moluccas which I collected are as follows: two from Wahaai, one from Piru, Ceram; six from Ternate; six from Obi; two from Galela, Halmahera Island, all fall together into another series, not a single specimen varying in the least towards the two races which we have mentioned. These individuals may be taken to represent:

D. smaragdinum moluccarum subsp. nov.

Type.—Adult from Wahaai, Ceram; Museum of Comparative Zoology, No. 7481, T. Barbour, collector.

The coloration of this may be described as that of a light gray ground color, more or less irregularly spotted and blotched with dark brown and black, giving what is commonly called a salt-and-pepper appearance. The writer has seen an enormous number of these lizards alive in very many localities, and his notes, made in the field, show that no variation from these conditions came under observation.

I have published the only known record for *D. smaragdinum* occurring in Formosa (Proc. N. E. Zool. Club, IV, Nov., 1909, p. 65). This was a young example and hence can not be definitely placed in a particular color phase as all the young seem to have a more or less similar color pattern.

Colored drawings based upon notes made in the field have been made to illustrate these three races.

Cryptoblepharus boutonii (Desjardin).

Desjardin Ann. Sci. Nat. (1), XXII, 1831, p. 298.
Boulenger, Cat. Liz. B. M., III, 1887, p. 346.

Type locality.—Mauritius.

This very widely distributed species is undoubtedly frequently carried about by human agency, and therefore it appears colonized in certain localities where no definite local races have arisen. However, local races seem to occur which often may be recognized by a definite color pattern, where, as in *D. smaragdinum*, structural differences do not seem to have become definitive as yet. Thus we have from the Bonin Islands *C. b. nigropunctatus* (Hallowell); from Papuasia, *C. b. peronii* (Coctean); while Garman has described and provided notes on others (Bull. M. C. Z. LII, 1, p. 12, June, 1908). He has proposed the varietal name *paschalis* for those upon Easter Island, based upon differences which "may at least be said to indicate the process of forming new species by means of hereditary tendencies in variation." Lizards from other islands have been discussed as though they represented full species. Thus, Garman considers *C. nigropunctatus* as of equal value to *C. boutonii*, from which it has undoubtedly been derived; and he speaks of *C. poecilopleurus* as a full species "likely to have sprung from *C. boutonii*." These forms are all better considered as geographic races of a single species; and only trinomial names express this condition. From the East Indian area we know, besides *peronii*, the subspecies *furcata*, of which Max Weber collected and described five specimens which did not vary in color. My examples from New Guinea, Jobi, and Waigiu all fall under *peronii;* while on the other hand examples from Bali and Lombok differ widely in coloration from others hitherto described, and may, I believe, with justice be considered to represent two other undescribed local races, judging by what we know of the distribution of the species as a whole. Thus from Bali we have

Cryptoblepharus boutonii balinensis subsp. nov.

Type.—Museum of Comparative Zoology, No. 7480; collected at Buleleng, Bali Island, by T. Barbour.

Scales in 24 rows. Olive above, with four darker areas on the back, separated by three light olive lines, and bounded below by the olive sides. The median light line forks near the region above the axil, and the two resultant lines continue down the back, bounding a median dark area which is wide and continued to the root of the tail, which latter is olive above and below.

Cryptoblepharus boutonii cursor subsp. nov.

Type.—Museum of Comparative Zoology, No. 7479, from Ampenan, Lombok Island, collected by T. Barbour.

The coloration of this form is as follows: Middle of the back light olive bounded on each side by a dark line, each of which meets the other at the root of the tail, and fades away. Outside of these two dark lines are first a silvery white line, beginning just above the eye, and running back to the base of the tail; and below this again there are wide black lines running down each side from back of the eye to the tail; they continue down the sides of the tail only a short distance, when they break up into series of spots, and become indistinct and disappear. The lower surface is silvery white. The limbs are checked with black and white square spots. The tail is olive above, lighter below, fading to reddish towards the tip.

Colored figures are being prepared of these specimens.

After the foregoing remarks on *Cryptoblepharus* had gone into type I received a paper from Dr. Jean Roux on the Reptiles and Amphibians of the Aru and Ké Islands (Abh. Senck. Naturf. Ges., Vol. 33, 1910, pp. 211–247, pls. 13–14). On page 240–241 he discusses at considerable length what he calls *Ablepharurus boutoni* var. *keiensis* n. var. This is figured; and shows that in the Ké Islands, as in the islands of the Lesser Sunda chain, we have a perfectly recognizable race which may be known as *Cryptoblepharus boutonii keiensis* (Roux); while on page 218 he shows us that the specimens from the Aru Islands may be referred to the subspecies *peronii* (Coct.).

Among the lizards captured by the naturalists on board the U. S. F. C. Steamer *Albatross* were a number of sail-tailed lizards. These Dr. Stejneger kindly lent me for study. Among them, most fortunately, was a single specimen from Amboina, the type locality of Schlosser's *Lacerta amboinensis*.* Now, a comparison of these specimens with others which I have from the Moluccas shows that we have been confounding several

* *Lophura* has been recently used for the genus by all authors. This generic name is, however, preoccupied, so that it becomes necessary to use *Hydrosaurus* (Kaup, Isis, 1828, p. 1147). In Boulenger's list of synonymous genera, *Istiurus* (Cuvier, R. A., 2nd Ed., II, p. 41) appears before Kaup's name. It was not, however, proposed until 1839

perfectly distinct forms under one name. A fully adult specimen from Ceram agrees perfectly with the topotype taken by the *Albatross*. These two specimens, however, are different from two other adults which I shot near Weeda, Halmahera; and from the others, which came from various localities in the southern Philippines. Judging from what Max Weber says (Zool. Erg. Reise Ned.-Ind., I, 1890, p. 167), we may conclude that the examples from Celebes represent another distinct form. We have then in the genus as it stands at present,

Hydrosaurus amboinensis (Schlosser), from Amboina and Ceram.
H. weberi sp. nov., from Halmahera.
H. microlophus (Bleeker), from Celebes.
H. pustulosus (Eschscholtz) from the Philippines.

For the sake of comparison with the description of *H. weberi*, sp. nov., I add here a similar diagnosis of the specimen from Ceram. Unfortunately no examples from Celebes are available for study, though we may expect a full description of *H. pustulosus* (Esch.) when Dr. Stejneger publishes his "Herpetology of the Philippines."

A few notes on the main diagnostic characters of this species are also added, thanks to Dr. Stejneger's courtesy, and with his permission.

Hydrosaurus amboinensis (Schlosser).

Described from an adult male, M. C. Z. No. 7504, taken at Piru, Ceram, February 3, 1907, by T. Barbour.

Head small; snout rather elongate, strongly compressed, with a very inconspicuous longitudinal crest of enlarged scales in the male. Vertical diameter of tympanum contained exactly twice in the distance from the anterior border of the eye to the posterior limit of the nostril. Upper head scales minute, very strongly keeled, larger in the frontal region than between the eyes; gular scales small, granular and of very unequal size; a series of enlarged scales on each side, parallel with the lower labials, beginning at the mental and extending backward, decreasing gradually in size until they disappear almost opposite the posterior border of the eye. Dorsal and nuchal crests continuous, composed of compressed, straight, lanceolate spines on the nuchal region, and of backward-curved, almost falciform, spines on the sacral region; the dorsal crest beginning at the shoulder region and extending backward about half way to the sacrum, is composed of small, inconspicuous scales much less in size than those of the nuchal or sacral areas; dorsal scales small, imbricate, keeled, the keels directed upwards and backwards, intermixed with a very few scattered, enlarged, roundish, short-keeled scales which vary somewhat in size; ventral scales larger than dorsals, subquadrangular, smooth, arranged in regular transverse series; an area of conspicuously enlarged scales on each side of the chest just in front of the insertion of the fore-limbs. Limbs rather long; the adpressed hind-limb reaches almost to the tip of the snout. Anterior face of fore-limb with greatly enlarged scales in three complete rows. Femoral pores nine on one side, ten on the

other. Tail covered with small quadrangular keeled scales above and on the sides, with larger, more heavily keeled ones inferiorly. Caudal crest high on the male, with denticulated border; the crested portion of the tail being contained three and one-third times in the length of the tail; which is two and two-thirds times as long as head and body. Olive above, spotted and vermiculated with black. Fold in front of shoulder black.

Hydrosaurus weberi sp. nov.

Type.—Museum of Comparative Zoology No. 7505; collected at Weeda, Halmahera, February, 1907, by T. Barbour.

Paratype.—M. C. Z. No. 7506, taken at same time and place.

Type an adult male, paratype an adult female.

Head deep and massive. Snout rather short, with a prominent, upraised area covered with greatly enlarged keeled scales instead of a longitudinal crest between the nostrils; tympanum small, its vertical diameter being contained almost three times in the distance from the anterior border of the eye to the posterior limit of the nostril, which is round instead of oval as in *H. amboinensis*. Upper head scales extremely small, strongly keeled, not conspicuously enlarged in the frontal area as compared to the region between the eyes; gular scales very small, granular; row of enlarged shields on each side parallel with the lower labials, commencing from the mental, and extending to a point below the anterior third of the eye. Dorsal and nuchal crests interrupted in the shoulder region; nuchal crest composed of short, thick, compressed spines; dorsal and sacral crests with uniform, elongate, recurved spines, these being most developed in the mid-dorsal region. Dorsal scales small, imbricate, keeled, the keels directed upwards and backwards, along each side seven groups, each composed of two or three very large, roundish, plate-like scales, shortly keeled; these are not so regularly distributed in the female (paratype). Limbs rather long, the adpressed hind-limb reaching the tympanum. Five or six series of enlarged and strongly keeled scales on the anterior face of the fore-limb; these rows are surrounded by very many partially complete series of scales almost as greatly enlarged, making a strong armor over the whole anterior face of the limb as against the three rows seen on *H. amboinensis*. Femoral pores 12 on one side, 13 on the other. Tail as in *H. amboinensis*, the crested portion being contained three and two-thirds times in the entire length of the tail; which is not quite twice as long as head and body. Color uniform dark brown, lower surface more yellowish.

This species may thus be distinguished at once from the type of the genus by its massive, bull-dog head, covered above with almost uniform minute scales; its small tympanum; and its entirely different nuchal and dorsal crest, its shorter tail and by the greater number of lateral enlarged scales.

This species is named in honor of Professor Max Weber, of Amsterdam, to whom we owe so much for his studies of East Indian zoögeography.

H. pustulosus, from the Philippines, has the crest between the nostrils

much more developed; a continuous dorsal and nuchal crest of very elongate, falciform spines; a large tympanum, the vertical diameter of which is contained only one and one-third times in the distance from the anterior border of the eye to the nostril; and a head of fundamentally different shape, larger than in *H. amboinensis*, and its elongate form reminds one of this species. The head is, however, longer in specimens of the same size, and the snout is declivitous, which gives it a more acuminate appearance. There are many groups of a considerable number each of enlarged plate-like scales on the side. In this character *H. weberi* is intermediate between *H. amboinensis* and *H. pustulosus*.

The type of the new toad which forms the last notice of this paper was taken under an upturned stone on the road between Ampenan and Mataram, on the island of Lombok. It may be known as

Bufo cavator sp. nov.

Type: Museum of Comparative Zoology, No. 2670, from Ampenan, Lombok Island.

Closely related to *Bufo biporcatus* Tschudi. Crown with bony ridges, rather feebly developed, viz., a supraorbital and a parietal, forming together a straight, or nearly straight, line, and a short orbital tympanic; snout short, with prominent canthus rostralis; interorbital space slightly broader than upper eyelid; tympanum distinct, circular, about $\frac{3}{5}$ diameter of eye; first finger as long as second, toes fully webbed except the fourth toe, which extends far beyond the web. Subarticular tubercles simple; two moderate metatarsal tubercles; tarsus without a fold. The hind limb being carried forward along the body, the tarso-metatarsal articulation reaches to the nostril. Upper surface with scattered warts which are not spiny; paratoids very prominent, small, almost circular. Brownish above, marbled with light yellowish; fore and hind limbs cross-barred with yellowish; beneath yellowish, throat dark brown.

This species may be distinguished from *Bufo biporcatus* at once by its much smaller tympanum, which is almost circular instead of vertical-oval. In *B. biporcatus* the upper boundary of the tympanum is formed by the orbito-tympanic ridge, which is not the case with this species. The shape of the tympanum is quite different in the two species; and in this new one the cephalic crests are not prolonged as far posteriorly as they are in *biporcatus*.